

REMARKS

Claims 1-8, 10-21 and 23-27, all the claims pending in the application, stand rejected on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion. The following paragraphs are numbered for ease of future reference.

I. The Prior Art Rejections

[0001] Claims 1-8, 10-21 and 23-27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Crampton (U.S. Publication No. 2004/0030428), hereinafter referred to as Crampton. Applicants respectfully traverse these rejections based on the following discussion.

[0002] With referenced to the published application (U.S. Patent Application Publication No. 2005/0171825), the embodiments of the present invention, like prior art production planning methods, include a receiving inputs step 101, a pre-processing step 102 (wherein input files are transformed into a form useable by a linear programming solver (see paragraph [0081]), a solving step 104 (wherein linear programming applications are used to determine a production plan, also referred to as an optimal raw output solution (see paragraphs [0080]-[0081]), and a post-processing step 106-108 (wherein the solution from the solver is transformed into a format acceptable for usage and output). However, in the embodiments of the present invention, the pre-processing and post-processing steps include additional, novel and non-obvious steps.

[0003] For example, in the present invention, during pre-processing inputs are not simply transformed into a useable format, rather a first rescheduling process is performed to reschedule “when said purchase order receipts are to be received by a plant so as to indicate that said purchase order receipts will be received by said plant” during earlier time periods than initially

specified (as in independent claim) or, more specifically, during the earliest time periods allowable by a supplier (as in independent claims 8, 15 and 21). Furthermore, in the present invention, during post-process, the initial production plan (i.e., the solution generated by the linear programming applications) is not simply transformed into a useable format, rather a second rescheduling process is performed to reschedule “when said rescheduled purchase order receipts from said first rescheduling process are to be received by said plant so as to indicate that said rescheduled purchase order receipts will be received by said plant during later time periods than specified during said first rescheduling process (as in independent claim 1) or, more particularly, during the latest time periods allowable by said supplier (as in independent claims 8, 15 and 21) without causing inventory balances to be depleted to zero. Then, based on the initial production plan and the second rescheduling process, a final production plan is generated and output. Thus, the final production plan in the present invention is based on both the initial production plan generated during the solving step and also on the second rescheduling process. The present invention has the advantage of allowing a linear programming solver to provide the vast majority of the decision making in determining the production plan, while incorporating the additional pre-processing and post-processing steps, as discussed above, to provide improved control of inventory in the final production plan (see paragraph [0012]).

[0004] Crampton relates to a method and system for fulfillment of customer orders in a supply chain by scheduling and sequencing multiple customer orders, scheduling and sequencing for use the various resources located in remote locations needed to fulfill such orders, and scheduling the used resources for replenishment at appropriate times (see paragraph [0003]). The system of Crampton is a two-tiered system, wherein the first tier schedules customer orders

to specific resources and/or sites and the second tier schedules specific resources to specific assignments in a specific sequence (see paragraph [0012]). The invention of Crampton includes a number of different features (e.g., the use of changeover models, the use of realistic models that simulate operations, etc.) (see Abstract). The output of the system of Crampton is a plan for using the resources in a supply chain (see paragraph [0051]). However, nowhere in Crampton does it teach the claimed pre-planning rescheduling process, followed by a core linear programming production planning process using the results of the pre-planning rescheduling, followed by a post-processing rescheduling process.

[0005] More particularly, the Applicants submit that Crampton does not anticipate or make obvious the following limitations of amended independent claim 1: (1) “performing, by said computer, a first rescheduling process comprising rescheduling when said purchase order receipts are to be received by a plant so as to indicate that said purchase order receipts will be received by said plant during earlier time periods than initially specified”; (2) “after said performing of said first rescheduling process, solving core production planning system equations with linear program using rescheduled purchase order receipts associated with said earlier time periods from said first rescheduling process so as to determine an initial production plan”; (3) “performing a second rescheduling process comprising rescheduling when said rescheduled purchase order receipts from said first rescheduling process are to be received by said plant so as to indicate that said rescheduled purchase order receipts will be received by said plant during later time periods than specified during said first rescheduling process without causing inventory balances to be depleted to zero”; and (4) “generating and outputting, by said computer, a final production plan based on said initial production plan and said second rescheduling process”.

[0006] The Applicants further submit that Crampton also does not anticipate or make obvious the following similar limitations of amended independent claims 8 (or the similar limitations of amended independent claims 15 and 21): (1) “performing, by said computer, a first rescheduling process comprising rescheduling when said purchase order receipts are to be received by a plant so as to indicate that said purchase order receipts will be received by said plant during the earliest time periods allowable by a supplier”; (2) “after said performing of said first rescheduling process, solving core production planning system equations with linear programming using rescheduled purchase order receipts associated with said earliest time periods allowable by said supplier from said first rescheduling process so as to determine an initial production plan”; (3) “based on said sorting, performing, by said computer, a second rescheduling process comprising rescheduling when said rescheduled purchase order receipts from said first rescheduling process are to be received by said plant so as to indicate that said rescheduled purchase order receipts will be received by said plant during the latest time periods allowable by said supplier without causing inventory balances to be depleted to zero”; and (4) “generating and outputting, by said computer, a final production plan based on said initial production plan and said second rescheduling process”.

[0007] In rejecting independent claim 1 (and similarly in rejecting claims 8, 15 and 21), the Office Action provides that Crampton discloses the following:

“performing, by said computer, a first rescheduling process comprising rescheduling when said purchase order receipts are to be received by a plant so as to indicate that said purchase order receipts will be received by said plant during earlier time periods than initially specified (see paragraph 81 and figure 4C, disclosing that scheduled receipts are moved to the beginning of a planning period; see also paragraph 117)”.

[0008] The Applicants respectfully disagree.

[0009] In the invention of Crampton, the process 100 typically begins when the planning model is defined at step 102. Figure 2 indicates the five types of data input and processed by the model: horizons 202, stock keeping units and order information 204, scheduled receipts 208, BOMs 210 and initial assignments 212 (see paragraph [0069]). SKU and order information 204 can include, among other inputs, replenishment inputs (see paragraph [0079]). Once such replenishment input relates to Lot-For-Lot replenishment, wherein a scheduled receipt is generated for each order at the start of each order (see paragraph [0080]). Another such replenishment input relates to Absolute Time Based Replenishment, wherein absolute time periods are defined for replenishment and wherein, within a defined time period, any scheduled receipts are aggregated and the time on these aggregated receipts for that defined period is set at beginning of the time period (see paragraph [0081]). For example, as illustrated in Figure 3C and described in paragraph [0081], if orders 1 and 2 are schedule to start within replenishment time period 1, the quantities of the orders are aggregated and receipt of the order to is reschedule to the beginning of the time period 1. Thus, while Crampton does disclose pre-processing that can include rescheduling receipts, rescheduling is only to the beginning of the same time period within which the order was already schedule to be replenished. Crampton does not disclose rescheduling to an earlier time period (as in claim 1), much less specifically rescheduling to the “earliest time periods allowable by said supplier” (as in claims 8, 15 and 21).

[0010] In rejecting independent claim 1 (and similarly in rejecting claims 8, 15 and 21), the Office Action provides that Crampton discloses the following:

“after said performing of said first rescheduling process, solving core production planning system equations using rescheduled purchase order receipts associated with said earlier time

periods from said first rescheduling process so as to determine an initial production plan (see paragraph 96, disclosing applying algorithms to determine an optimal production plan after the inputs, including the scheduled receipts, have been initially processed)”.

[0011] The Applicants respectfully disagree.

[0012] Paragraph [0096] simply provides that once the inputs 202, 204, 208, 210 and 212 are entered into the system, a series of algorithms can be applied to produce a globally optimal solution for the manufacturing problem. The subsequent paragraphs describe the use of heuristics to do this. Thus, as discussed in detail above, Crampton does not disclose the same preprocessing receipt rescheduling as claimed in the present invention and, thereby does not disclose the claimed solving of planning equations based on such rescheduling. Furthermore, nowhere in the Crampton does it disclose actually disclose solving core production planning system equations or, more specifically, doing so with linear programming. Thus, the Applicants submit that Crampton does not disclose the limitations of “solving core production planning system equations with linear program using rescheduled purchase order receipts associated with said earlier time periods from said first rescheduling process so as to determine an initial production plan” (as in claim 1) or “solving core production planning system equations with linear programming using rescheduled purchase order receipts associated with said earliest time periods allowable by said supplier from said first rescheduling process so as to determine an initial production plan” (as in claims 8, 15 and 21).

[0013] In rejecting independent claim 1 (and similarly in rejecting independent claims 8, 15 and 21 and dependent claims 11, 16, 18, and 24), the Office Action provides that Crampton discloses the following:

“performing a second rescheduling process comprising rescheduling when said rescheduled purchase order receipts from said first rescheduling process are to be received by said plant so as to indicate that said rescheduled purchase order receipts will be received by said plant during later time periods than specified during said first rescheduling process without causing inventory balances to be depleted to zero; and generating and outputting, by said computer, a final production plan based on said initial production plan and said second rescheduling process (see paragraphs 217-219, disclosing post processing to ensure optimal use of resources; if a purchase is greater than the maximum order size, it can be split and excess purchases will be carried over to the next purchase so as to minimize inventory).”

[0014] The Applicants respectfully disagree.

[0015] Paragraphs [0217]-[0219] of Crampton refer to post-processing. Specifically, they provide that after a schedule has been generated, post-processing can be performed to ensure availability and optimal use of remaining resources. One post-processing function involves generic storage of remaining materials. Another post-processing function involves ISRs, in which the replenishment of materials is constrained by period maximums. The solution is to adjust the created scheduled receipts to match the material in each period relative to the maximum amounts possible. Thus, the cited portions of Crampton do mention possible rescheduling receipts, but doing so simply to match available materials. The cited portions of Crampton do not disclose or make obvious the claimed feature of “rescheduling when said rescheduled purchase order receipts from said first rescheduling process are to be received by said plant so as to indicate that said rescheduled purchase order receipts will be received by said plant” either “during later time periods than specified during said first rescheduling process” (as in claim 1) or “during the latest time periods allowable by said supplier” (as in claims 8, 15 and 21) and doing so “without causing inventory balances to be depleted to zero.” That is, Crampton discloses generally rescheduling if, because of constraints on material replenishment during a given timer period, insufficient materials

would available. However, it does not disclose rescheduling specifically to a later time period unless doing so would result in a depletion of materials down to zero. Finally, Crampton discloses outputting a plan. However, it does not disclose that such a plan is output specifically based on a second rescheduling process, as discussed above, wherein receipts are rescheduled to be by a plant” either “during later time periods than specified during said first rescheduling process” (as in claim 1) or “during the latest time periods allowable by said supplier” (as in claims 8, 15 and 21).

[0016] In rejecting dependent claim 2, the Office Action provides that Crampton discloses the following:

“Crampton discloses wherein said first rescheduling process is based upon a field that indicates whether a receipt may be rescheduled to an earlier point in time (see paragraph 92, disclosing that scheduled receipts can have start and end times; paragraphs 70-71, disclosing material horizons; paragraph 109, disclosing hard, soft, and no constraints)”.

[0017] The Applicants respectfully disagree.

[0018] Paragraphs [0070]-[0071] relate to setting scheduling and replenishment horizons and paragraph [0092] defines scheduled receipts. Paragraph [0109] relates to how replenishments are created according to user defined constraints. None of the cited prior art references disclose a process whereby receipts are reschedule, much less that this process is done based on a field that indicates whether rescheduling to an earlier point in time is possible.

[0019] In rejecting dependent claim 3, the Office Action provides that paragraph [0064] of Crampton discloses a first rescheduling process that is based on frozen zone rules. The Applicants respectfully disagree. Paragraph [0064] relates to initial assignments and allocations of materials. Specifically, it mentions a table which pre-assigns resources to orders. These

initial assignments are used to freeze orders (i.e., to reserve a location/resource for fulfilling an order). It does not disclose rescheduling receipts based on frozen zone orders.

[0020] In rejecting dependent claim 4, the Office Action indicates that “Crampton discloses wherein said second rescheduling process is based upon one of a date of need (see paragraph 66), frozen zone rules (see paragraph 64), and date tolerances (see paragraph 92).” The Applicants respectfully disagree. As discussed in detail above, the claimed second rescheduling process is a post-processing process. The cited portions of Crampton, however, relate specifically to pre-processing inputs.

[0021] In rejecting dependent claims 5 and 6 (and similarly in rejecting dependent claims 10, 17 and 23), the Office Action indicates that “Crampton discloses after said solving, sorting of said rescheduled purchase order receipts from said first rescheduling process (see paragraphs 66 and 97-104 disclosing sorting)” and that “Crampton discloses wherein said sorting is based upon one of arrival dates, purchase order receipt quantity, and the flexibility of purchase order receipt movement with respect to frozen zone rules (see paragraphs 66 and 97-104 disclosing sorting, disclosing sorting by date, replenishment quantity, and inventory available date).” The Applicants respectfully disagree. While the cited portions of Crampton disclose sorting, such sorting is not after a rescheduling process, nor is it based on arrival dates, purchase order receipt quantity, and/or the flexibility of purchase order receipt movement with respect to frozen zone rules.

[0022] In rejecting dependent claim 7 (and similarly in rejecting dependent claims 13, 20 and 26), the Office Action indicates that “Crampton discloses recomputing ending inventory levels to reflect said rescheduling process (see paragraph 104, disclosing inventory levels).” The

Applicants respectfully disagree because Crampton discloses calculating inventory levels but not to reflect a second rescheduling process.

[0023] In rejecting dependent claim 12 (and similarly in rejecting dependent claims 19 and 25), the Office Action indicates that “Crampton discloses wherein if a time period for receiving by said plant of a purchase order receipt can be extended beyond the latest date of the planning horizon of said linear programming production planning system, said purchase order receipt is eliminated (see paragraphs 70-72, disclosing horizons).” The Applicants respectfully disagree. The cited portions of Crampton define scheduling and planning horizons. They do not, however, disclose a situation, where “if a time period for receiving by said plant of a purchase order receipt can be extended beyond the latest date of the planning horizon of said linear programming production planning system”, then the purchase order receipt is eliminated.

[0024] In rejecting dependent claim 14 (and similarly in rejecting dependent claim 27), the Office Action indicates that “Crampton discloses wherein said second rescheduling process limits rescheduling to comply with contractual obligations and to avoid trivial rescheduling (see paragraph 64, disclosing freezing particular orders).” The Applicants respectfully disagree. Paragraph [0064] is related to pre-processing inputs to a assignment table, whereas the subject claim limitation relates to a post-processing rescheduling process. Furthermore, nowhere in paragraph [0064] does it refer to contractual obligations or avoiding trivial rescheduling.

[0025] Therefore, the Applicants submit that amended independent claims 1, 8, 15 and 21 are patentable over the cited prior art reference. Further, dependent claims 2-7, 10-14, 16-20, and 23-27 are similarly patentable, not only by virtue of their dependency from a patentable independent claim, but also by virtue of the additional features of the invention they define.

Moreover, the Applicants note that all claims are properly supported in the specification and accompanying drawings, and no new matter is being added. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

II. Formal Matters and Conclusion

With respect to the rejections to the claims, the claims have been amended, above, to overcome these rejections. In view of the foregoing, Applicants submit that claims 1-8, 10-21 and 23-27, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. Therefore, the Examiner is respectfully requested to reconsider and withdraw the rejections to the claims and further to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,

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